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The Construction and Evaluation of a Questionnaire Measuring Geekism

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Abstract

Despite a dominant focus on utilitarian product-features, contemporary usability research acknowledges more subjective, hedonistic values as joy or aesthetics. However, individual differences in users are a rare discussed topic, especially when it comes to their needs and drives to use a product. Results of Schmettow, Noordzij, & Mundt (2013) indicate the existence of a user-group**,** who is extremely interested in technical systems and who like**s** to modify and play with technology, calling them *geeks*.

Until now, geeks don't profit from usability research as they are not so much interested in utilitarian or hedonistic product values. If geeks could be identified successfully, usability in software or hardware could be improved for these users. Based on a qualitative interview study of Florian Passlick (2013), in which he gave insights of the construct *geekism,* a questionnaire measuring geekism was constructed and evaluated. Although many items showed low discriminant power, test-retest reliability was high (.93) as well as Cronbachs alpha (.96). Construct validity was examined through correlational measures with a scale measuring Material-Posession-Love MPL, a scale measuring the Need for Cognition NCS and with an implicit PES-test geekism on one of its subscales. The convergent validity was evaluated as acceptable with a significant correlation between the PES and the geekism scale of (r.=0.53). Unexpectedly, the Geekism questionnaire correlated with the scale of material possession love (r =.48). The geekism-scale correlated expectedly moderate with an r.=.357 as the NFC is a similar construct but not the same. Overall, the geekism scale seems to measure *geekism* successfully, however, it needs to be optimized.

Samenvatting

Ondanks een dominante focus op utilitaire product-eigenschappen herkent moderne usability-research tegenwoordig meer subjectieve, hedonistische waarden zoals *joy* of *esthetiek*. Echter, individuele verschillen in gebruikers zijn een zeldzaam besproken onderwerp, vooral als het gaat om hun drang en behoeften om een producten te gebruiken. Resultaten van Schmettow, Noordzij, & Mundt (2013) verwijzen op het bestaanvaneen user-groep, die uiterst geïnteresseerd is in technische systemen, die deze willen modificeren en ervan houden met technologie te spelen. Ze worden *geeks* door hun genoemd.

Tot nu toe profiteren *geeks* niet van usability-research, omdat zij minder geïnteresseerd zijn in utilitair of hedonistisch product-waarden. Als *geeks* met succes zouden kunnen worden geïdentificeerd, kan de gebruikersvriendelijkheid in de software of hardware verbeterd worden voor deze gebruikers. Op basis van een kwalitatieve interview-studie van Florian Passlick (2013), waarin hij inzicht gaf van het construct geekism, werden vragenlijst over geekism geconstrueerd en geëvalueerd. Hoewel veel items laag discriminant-power aantoonden, was de test-hertest betrouwbaarheid hoog (r = 0,93) als ook Cronbachs alpha (.96). De constructvaliditeit werd onderzocht door middel van korrelationele analyse met de *Material-Possession-Love* scale (MPL), de *Need for Cognition Scale* (NCS) en meet een impliciete PES-test welke geekism op een subschala meet. De convergente validiteit werd beoordeeld als acceptabel met een significante correlatie tussen de PES en de Geekism-schaal van (r. =0,53). Onverwacht correleerde de Geekism-vragenlijst met de MPL (r =.48). De Geekism-Scale correleerde verwacht met een r.=.357 omdat de NFC een soortgelijke constructie is, maar niet exact dezelfde. Kortom, de Geekism-schaal lijkt geekism met succes te meten, maar het moet worden geoptimaliseerd.

Introduction

Following the enormous growth of human-computer-interaction in the last three decades (Carroll, 2013), researchers strived to assess, qualify and enhance the usability of interactive products(Schmettow, Noordzij, & Mundt, 2013).

So far, a great deal of research limited usability-studies to hedonistic and utilitarian product attributes.Utilitarian product-goods can be defined as “primarily instrumental and functional” like microwaves,minivans and personal computers as well as instrumental, task and goal oriented and cognitively driven (Strahilevitz& Myers, 1994; Holbrook, M., Hirschman, 1982). Furthermore utilitarian products accomplishes a functional or practical task (Strahilevitz& Myers, 1994). Many usability studies focuses on these describes characteristics as thefamous ISO standard 9241-11 (ISO, 1998)which defines usability as follows: “Extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”. The definitionemphasizes the task and goal-orientation as well as product features like efficiency and effectivity.Another example of usability research with a focus on utilitarian qualities gives the prominent work of Jakob Nielsen (1993),who defined usability as the ease-of-use of a product (Nielsen & Hackos, 1993).According to him, the ease-of-use of a product is put together by five differentcomponents: *learnability*, *memorability*, *efficiency*, *error-rate* and *user satisfaction*.

The variable *user-satisfaction*, present in Nielsons book (1993) as well as in the ISO standard 9241-11, is noteworthy, because it is more subjective than their other usability-determinants. Although both studies specify*user satisfaction*as the experienced pleasure of a product, the interpretation of pleasure and satisfaction differs between these two studies:Consistent with the ISOs’ utilitarian focus of usability, *user-satisfaction*is described in a very functional, pragmaticway: It can bemeasured by the “workload when carrying out different tasks, or the extent to which particular usability objectives (such as efficiency or learnability) have been met”(ISO, 1998). As suggested by Carrol(1988), Nielson definesthe users’ satisfaction in a more hedonistic way, stating that users should have an “entertaining and/or moving and/or enriching experience”. Hedonistic product-values include experiential aspects such as the beauty of a product, the experienced joy or excitement while using the product(Wertenbroch & Dhar, 2000). Hedonic goods are also characterized by experience of aesthetic, sensual pleasure, fantasy, and fun(Holbrook, M., Hirschman, 1982). Next to Nielsen, different other studies usehedonistic product aspectsto qualifythe usability of product.Igbaria, Schiffmann & Wieckowski (1994) showed that the experienced joy while

using software had influence on the acceptance and satisfaction of the software. Similar results were obtained by a study measuring the effects of the aesthetics of a web-store on the attitude towards the store (Porat & Tractinsky, 2012).

Although most studies in recent user-experience research approach specific product features (Schmettow et al., 2013), Dillon and Watson (1996) emphasize the importance of user-analysis in usability research. Nielson (1993) mentions individual differences but limits the distinction of users to their computer-experience, system experience and domain-knowledge. Subsequently he gives instructions on how to structure menus for novice and for expert users to achieve a better performance. According to Dillon & Watson (1996)measure of individual differences need to go beyond categories as experience and knowledge and conclude that Human-Computer-Interaction "could gain significant predictive power if individual differences research was related to the analysis of users in contemporary systems design". Allen (1994)studied the effects of cognitive ability on information-retrieval-performance between different system-designs which displayed items either in ranked or in non-ranked-order. Allen reports significant interaction-effects of logical reasoning and item-order design: His results indicated enhanced performance of users with low logical reasoning when presented with a ranked-item-order.A study of Sein, Olfman, Bostrom, & Davis (1993)studied the individual user-difference in visual ability and its effect on learning different software (email, modeling software and operating systems) and found out that users with a high visuals ability learned to control the software.In addition to it he showed that different interface-designs can reducedthe differences in performance.

The studies of Nielson (1993), Allen (1994) and Seine et al. (1993) are interesting because they focus on the user instead of product features.Mapping individual differences to interface-characteristics, user differences are used to improvequalities like performance and efficiency of a product. Again, the purpose of assessing personal differences is the enhancement of utilitarian goals. As these studies limit users' differences to cognitive abilities and don't addressother objectives than the utility of a product,Schmettow, Noordzij, & Mundt (2013) studied different drives for using a product at first place. Hypothesizing that there might be a subpopulation which is not interested in the products' ease-of-use or itshedonistic values, they searched for users who are appealed by technical product themselves. Using a modified version of the implicit stroop-priming-task, their resultsindicate the existence of computer users with "the strong urge and endurance to understand the inner workings of a computer system". According to Schmettow et al. (2013),these users "understand technical systems, modify and play with them". Using priming-pictures and priming-words, Schmettow

et al.measured the reaction times of the participants. As some participants had higher reaction times when primed with words or pictures from the “geek-mindset” (as “modify” and “improve”) it was assumed that these persons had a higher (unconscious) association of these words and/or pictures, therefore reacting more slowly.

Following Schmettow’s research (2013)Florian Passlick (2013) studied the meanings and perceptions of self-proclaimed geeks in an qualitative interview study in order to give more insights in the construct of geekism. He describes *Geeks* as intellectual when it comes to the use or interaction with technical products.The results of Passlicks study (2013) indicate a very heterogenous geek-culture, neverless there where many different elements which were mentioned more often by his participants. First of all, beeing an expert in their subject area was a prominent definition of his participnats when they were asked about the meaning of beeing a geek. According to Passlick, another answer that emerged more often was supportive and helpful behaviour for example when helping other people online on message boards or helping family members with computer problems. Also, “beeing special” in some kind of sense and understanding the functions of technology were prominent answers.

When Passlick asked questions about technology, his repondents revealed an “intense enthusiasm for the progress of technology and possible developments of the future as well as for the automatization and optimization of various processes” (Passlick, 2013). Again other participants showed an affection for versatile products with a many different features that can be used in different ways.

To assess the emotional experiences of geeks when interacting with technology, Passlick asked questions about feelings that were of importance to the interviewees. His respondents reported joyful experiences when mastering a challenging task or gaining new understanding of technology. However, also negative feelings like frustration or discouragement were reported. Another important element mentioned more often was curiosity and feelings of control. Examples for curiosity included learning new programming-languages of using already known technology in a different way. Feelings of control were mentioned when working with software and hardware, but also while using the internet showing a concern for privacy.

Trying to get insight in the motivational factors of geeks, Passlick identified the geeks’ concern for positive feedback from other people. Another source of motivation for many interviewees was re-using products or alienating them through customization.

Sharing knowledge and co-operating with others also appeared to be an important concept of the geeks, together with a “feeling of community within the geek-culture”. Furthermore,

valuing objectivity, neutrality and scientific standards were regarded important when working with technology for.

When asked the Geeks about important experiences, that might have influenced their geek attitude, many participantstold about their father who introduced them to technologies or explaining them the functionality of technological products. Finally, as most of the geeks followed university subjects related to technology or were already employed at this area, Passlick concluded that the geeks' interest in technology seems to be so important to the point that it influences life choices.

Here are the elements which were mentioned most often by the participants:

- Joy through accomplishment
- Joy through new knowledge
- Joy through challenge
- Frustration through personal failure
- Being in control of device
- Being in control of own data
- Being curious about functioning
- Being curious about others work
- Value of sharing / supporting
- Value of objectivity
- Interest in progress of technology
- Interest in deeper understanding of technology
- Interest in automatization
- Interest in versatile products
- Distinguished by subject matter
- Distinguished by dealing with geekness
- Motivated by social acknowledgement
- Motivated by re-using / alienating products
- Motivated by optimization
- Being motivated by geek-culture
- Being an expert in subject area
- Helpfulness and giving support
- Having a special mindset
- Invest time / effort in subject
- Influenced by father
- Influenced by peers
- Influenced by education / occupation

Although a heterogenic group, Passlick (2013) successfully explored the concept of geekism and identifieddifferent typical elementsof self-proclaimed geeks. He confirmed Schmettow's et al.(2013) results of a user group who is focused on the technology itself and which seems to have different objectives when using technology than users with an utilitarian and/or hedonistic need.

Continuing Schmettow's and Passlick research, this study tries to continue their work and develop a measurement-instrument that can identify these computer-users with geekism. Until now, only users who strive for utilitarian or hedonistic values can profit from usability research. As people with geekism seem to have different needs and drives for using interactive products, including their drive to understand technical systems, modify and play with them (Schmettow et al., 2013), a proper adjusted interfaces ordifferent product-features

could improve their user-experience. When looking at the fact that most of the geeks are studying subjects related to technology or are employed in a company related to technology (Passlick, 2013), we assume that many geekswill have to work with technology on a daily bases. Therefore it seems substantial that their individual characteristics should be included in contemporary usability research.If users could be identified successfully as geeks, usability in software or hardware could be improved for these users. The same arguments can be applied for consumer research:A *geek*, would prefer a smartphone with an open source operating system and a hardware-connection instead of an aesthetic design.

As this study aims different drives and needs of users rather than product features, it can be seen as an interdisciplinary research between personality assessment and usability studies. Goldberg (1972) formulated three goals for successful personality assessment

1. Identifying important personality characteristics that ought to be measured

2. Developing measures that best access these characteristics,

3. Establishing methods for effectively using assessment results in research and practice.

Our work will proceed with goal two, as we evaluate goal one as accomplished by the work Schmettow et al. (2013) and Passlick (2013).

In order to develop the best measurement to access the characteristics of a person with *geekism*, we chose for the construction of a questionnaire within a multi-method-approach. Questionnaires are widespread in social research because of their cost- and time efficiency when compared to other research methods. With statistical software, questionnaires can be analyzed easy and objective and don't rely on the research researchers' rating which can bias the results. As our questionnaire forms part of a multi-method studie, we profit from aforementioned benefits while avoiding problems from self-report measures as social desirable answers. As stated by Lucas & Baird (2006): "multi-method research is one of the best ways to overcome the problems associated with communicating self- reported judgments". Another positive effect of multi-method assessment includes the possibility analyze the convergent validity. The convergent validity of a trait or behavioral construct can be verified through correlational measures between different methods measuring the same construct (Lucas & Baird, 2006). Julian Keil's PES (2013)was developed simultaneously with our study and also aims at measuring the construct of geekism. Keil developed a Picture-Exercise-Scale animplicit and projectiveresearch-method, focusing on small stories, written

by the participants after seeing ambiguous pictures. 15 pictures (eight per test) present a situation with a technological context (robots, computer) and the participant is asked to explain the situation, giving meaning to the situations. As it is assumed that the process of creative writing is influenced by the participants' implicit drives and needs, the stories will be ratedby a researcher on three dimensions: geekism, hedonism and utilitarianism.

During Passlick'ssemi-structured interviews, the main characteristics of a person with geekism were studied and will be used as a basis for the tests' item-construction. Furthermore new items will be constructed which are expected to be discriminant for people with geekism but which weren't mentioned in Passlick's study.

The reliability evaluation of the questionnaire will focus on the common analysis methods including the analysis of the items' answer range distribution, the items' loadings to the general construct, test re-test reliability and internal consistency. Because most of our items were based on a semi-structured interview study with self-proclaimed geeks, content validity was evaluated as good. Construct validity of the test will be measured through correlational analysis with Florian Keils PES. Through correlational measures, our scores will be compared to the Material Possession Love Scale (MPL)(Lastovicka & Sirianni, 2011) and to the Need for Cognition Scale (NFC)(J T Cacioppo, Petty, & Kao, 1984).

The Need for Cognition scale measures the extent to which one is appealed by challenging cognitive activities, detailed information about the world, or by "cognitively effortful problems, life circumstances, or tasks"(J T Cacioppo et al., 1984; John T. Cacioppo, Petty, Feinstein, & Jarvis, 1996). As individuals with a high need for cognition are not strongly influenced by surroundings aspects as the aesthetic of a product, the Need for Cognition scale seems to be very suited for our purposes of comparing our geekism scale with the results of the need for cognition scale (John T. Cacioppo et al., 1996). Also, Schmettow et. al. (2013) could successfully approximate the scoring of geeks with the NFC.

The Material-Possession-Love scale measures, as indicated by the title, discrete emotional attachment between humans and objects who sometimes, in their minds, "blur the distinction between human and object relationships" (Lastovicka & Sirianni, 2011). As geeks are appealed by technical products in a different manner than other users, correlational analysis with the MPL can give interesting revelations about the geeks' attachment to their technology.

Finally it is important to mention that this questionnaire should be seen more of a pilot study, which analysis-results can be used to refine and enhance the questionnaire in future studies.

Method

Test Construction

Scaling

As mentioned before, a self-administered questionnaire was chosen to be the most appropriate assessment method. The aim was to construct a questionnaire which measures the degree to which one has got *geekism*, therefore the test-design included graded answer-possibilities with an ordinal test-scores. The multiple choice answers to our items will be formulated in the popular Likert-format, which allows respondents to specify their level of agreement or disagreement within four alternative responses. We used 4 answer possibilities to bring the participants to answer in one direction..The Likert-format offers a quick, reliable and inexpensive method for data-collection and data-analyzing which may account for its widespread popularity (Cohen & Swerdlik, 2009). The item *no answer* was added in order to check for items which participant find difficult to answer. The answer possibilities are:

1. I Totally agree
2. I agree
3. I disagree
4. I totally disagree
5. No answer

Itempool

While the item-pool was constructed, the qualitative study of Florian Passlick (2013) was taken into account to ensure content validity. Passlick study (2013) also served as a basis for the construction of the questionaires' items. Many of the passlicks geekism-elements were mentioned by less than 50% of the his sample (n=10), but nevertheless they were used in our study, having in mind possible errors in Passlick's study resulting from his small sample size, and to preempt missing important elements of the geekism construct. As Schmettow's results (2013) indicate different motivational prepositions in geeks for interacting with technology, our questionnaire includes a subscale named *motivations* to discriminate people with geekism from people without geekism. At first, we chose following elements from passlicks study which were most representativ as motivational factors in our opinion.

- Joy through accomplishment
- Joy through new knowledge
- Joy through challenge
- Being curious about functioning
- Being curious about others work
- Interest in progress of technology
- Interest in deeper understanding of technology
- Interest in automatization
- Interest in versatile products
- Beeing in controle of the device
- Motivated by social acknowledgement
- Motivated by re-using / alienating products
- Motivated by optimization

Because *Joy through new knowledge, Beeing curious about functioning, Interest in deeper understanding of technology, Being curious about others work*and *Interest in progress of technology*were very similar,looking at the quotes on which passlick based these three elements, we reduced them to one category. We hypothized that all these elements are based on one intrinsic motivation, we called *Beeing curious about technology. Joy through accomplishment* was discarded because of our hypothized lack of discriminablity: It was assumed that the experienced joy after finishing a computer-relating task is due to the finishing of the task itself and does not specifically account for computer-related projects or tasks or just for people with *geekism*.Also, The the element *Motivated by social acknowledgement* was discarded because we assumed that most behaviour is motivated by social acknowledgement and that it won't discriminate people with geekism from people without geekism.*Interest in automatization* was discarded because we expected everyone to be interested in computers which simplify daily life through automatization. The remaining items were used as a basis to create the first items for our subschale motivations.

While creating the items, the guidelines of deVille (2003) for item-writing weres kept in mind: It was tried to keep the items as specific as possible, exceptionalle long items were avoided and the reading difficulty was checked for appropiateness. Items which conveyed two or more ideas at the same time were discarded. Importantly, all quotations of Passlow participants, on which he based the specific elements, were reviewed, to get a picture of what the elements names actually referred to. Some quotationswere also used as a basis toformulate items.

The following chart shows the itempool for our subschale motivation, related to their respective elements from passlicks study.

Motivations	
Being curious about technology	• Ich möchte verstehen wie Computer(teile)/Software funktionieren • Das Innenleben in technischen Geräten und/oder Programmieren von Software interessiert mich nicht • Ich eigne mir gerne Wissen an bezüglich technischen Geräten (Hardware/Software)
Joy through challenge	• Komplizierten Vorgänge mit technischen Geräten schrecken mich ab • Herausforndernde Aufgaben an technischen Geräten reizen mich.
Interest in versatile products	• Ich mag technische Geräte die sehr viele verschieden Funktionen haben • Ich bin interessiert in technische Produkte welche vielseitig einsetzbar sind
Beeing in controle of the device	• Ich habe das Gefühl wenig Kontrolle über meine technischen Geräte zu haben • Ich mag es technische Geräte genau so steuern zu können wie ich es möchte.
Motivated by optimization	• Es motiviert mich technische Geräte zu optimieren/auf meine Wünsche anzupassen.. • Viele Enstellungsmöglichkeiten an technischen Geräten finde ich abschreckend

While analyzing the different elements passlick found in his qualitative study, some elements seemed to be related to specific values within the geek culture.As values are considered subjective and vary across people, groups and cultures, values of the geek-culture was considerd as a potent discriminate variable in our questionaire. Following elements were chosen build the basis for the items for the subschale Values.

- Being in control of own data
- Value of sharing / supporting
- Value of objectivity
- Helpfulness and giving support
- Having a special mindset

Because the elements *Values of sharing / supporting* and *Helpfulness and giving support* inculded both the idee of support we split them up to *Value of sharing* and *Helpfulness and*

*giving support.*The element *Having a special Mindset* was discarded because the quotes relating to this element were too vague to construct differential items and because wie diddnt assume this elemt to be discriminate. Passlick described this element asthe idea that geeks are "being special, unique or different from others in some way", which we assumed is an idea which can be found in geeks as well as in people without geeksm. Following Items were created having in all the implications which were mentioned above relating to the creation of items:

Values/Attitudes	
Being in Control of own data	• Privatsphäre(-einstellungen) am Computern oder im Internet ist sehr wichtig für mich. • Es ist wichtig das sich jeder Gedanken macht was er ins Internet hochläd und was nicht.
Value of sharing	• Ich teile gerne meine Ideen und Projekte mit anderen. • Mir ist es wichtig das Menschen freien Zugung zu meinen Projekten oder Arbeiten haben.
Value of Objectivity	• Objektivität ist wichtig für mich. • Ich versuche so wissenschaftlich wie möglich an Dinge heranzugehen.
Helpfullness and giving support	• Ich finde es toll dass sich Computerbenutzer sich gegenseitig (Foren, Websites) bei Problemen helfen.
Hedonism	• Wenn ich mir ein neues Computergerät kaufe ist mir die Leistung wichtiger als das Äußere. • Ein technisches Produkt muss für mich schön aussehen.
Other	• Ich denke es gibt Menschen die mich eine Computerfreak nennen würden.

We hypothized that an important third variable which discriminates geeks from people withoutgeekism would be their actual behaviour in the everyday life. Therefore we constructed the third subschale called Behaviour based on these elements:

- Being an expert in subject area
- Helpfulness and giving support
- Invest time / effort in subject
- Values of sharing

Behaviour	
Invest time / effort in subject	• In meiner Freizeit verbringeich nicht mehr Zeit am Computer/an technischen Geräten als andere Menschen. • Ich investiere viel Zeit und Mühe damit Dinge mit Computergeräten/Software auszuprobieren.
Being an expert in subject area	• Ich verfüge über ein großes Wissen was Computergeräte betrifft (Hardware/Software). • Wenn es probleme mit technischen Geräten gibt muss mir meistens jemand anderes helfen.
Helpfulness and giving support	• Wenn hemand Hilfe mit dem Computer/technischen Gerät braucht versuche ich so gut wie möglich zu helfen.
Value of sharing	• Ich habe schonmal ein Projekt/Arbeit von mir frei ins Internet gestellt, bzw würde dies tuen.
Being in Control of own data	• Ich achte sehr Bewusst auf den Umgang meine eigenen Daten bzgl. Privatsphäre.
Re-using / alienating products	• Technische geräte verwende ich teilweise anders als vorhergesehen. • Ich habe schonmal technische Geräte zweckentfremdet oder modifiziert. • Ich habe schon öfters technische Geräte geöffnet um zu schauen wie diese von innen aussehen.
Other	• Ich vermeide die erweiterten Optionen meiner technischen Geräte.

Scoring

There scoring follows the cumulative model: The higher the test score on the test, the higher the degree to which one has got the construct *geekism.* The answer possibilities will get scored like this:

I Totally agree (2 points)

I agree (1points)

I disagree (-1 points)

I totally disagree (-2 point)

Can’t answer (0 points)

Participants

In order to get significant results, the study was designed to find more or less 80 participants, having in mind the money and the time available. To efficiently validate the questionnaire and because of the construct *geekism* which was to be investigated, it was necessary that our sample included people with *geekism.* Stratified sampling was chosen to enhance the probability of people with *geekism* within our study. To reduce statistical bias, the sub-groups were then sampled randomly. Our first strata were university-students studying creative technology, computer science or electro-technic which were expected to have a higher probability of including people with *geekism.* This subgroup was recruited in their respective inherent university-buildings, and through personal contacts, offering them a small amount of money for participating. Our second strata were university-students studying subjects within behavioral-science. As required by the regulations of the university, these behavioral-science-students have to participate in a certain amount of intern studies and didn't receive any money for their participation. They were reached using a university-intern website (SONA) for the purpose of finding participants. To achieve the goal of more or less 80 participants, it was necessary to recruit part of the participants through convenience sampling, asking especially people who were evaluated as having *geekism* by the researchers. Using social media or through direct contact, friends or classmates of the researchers were hired. The only requirement for the participants was the absence of any reading or writing impairments.

Our final sample included 61 subjects who participated in our study. The mean age of our participants was 25 years with the youngest participant being 14 and the oldest participant being 65 years old. The gender distribution was nearly balanced with 44,3 % female participants and 55,7 % male participants.

34,4 % of our participants were expected to have *geekism* coming from subjects as Electro-technic, Computer-science or Informatics. 39,3 % of our subjects were psychology-students.

Procedure

The participants of the study were invited to two different testing-sessions to reduce priming bias of two implicit tests. After attending to us via email or SONA, they received an email with the date and place where the testing would take place. Other participants were recruited in our personal environment. The first session were group sessions with approximately 5- 10 participants per appointment. This approach was chosen to reduce the costs and the time of the study. In the first appointment, the participants received an informed consent before they were asked to fill out several questionnaires: the *Geekism*-Questionnaire which was constructed in this paper, The Schwarz-Value-Scale, TheNeed-for-cognition-scale and the

Material-Possession-Love Scale. Furthermore, the participants had to make an implicit projective test constructed by Julian Keil, another student from the research group. In the second session, a modified version of the stroop task was conducted, measuring implicit motives for using a computer-device (Schmettow et al., 2013). Also, the Geekism-Scale was retested.

Data-analyzing

Before analyzing, item-scores of the items 4, 7, 8, 13, 14, 28, 29 and 30 were inverted because they were formulated negatively. Also, sum-scores of all the items were calculated following the scaling described earlier as well as standardized scores.

Starting with the analysis of the participants, we checked the geekism-scale for gender of age-effects, followed by the item-analysis. Because a good test item should distinguish people with low *geekism* from people with high *geekism,* items with a low discriminate power were searched. Also, all items were checked for irregularities in the answer-range-distribution and for items that were answered many times with *no answer*. The reliability of the scale was measured through the test-retest method, and Cronbachs alpha was used to test the inter-item consistency. Convergent validity was examined through correlations between the Geekism-Scaleand Julian Keils PSE geekism -sub-scale. The discriminant validity was examined through correlational measures with a scale measuring material possession love as we hypothesized that object-love is another construct than geekism.

Evaluation

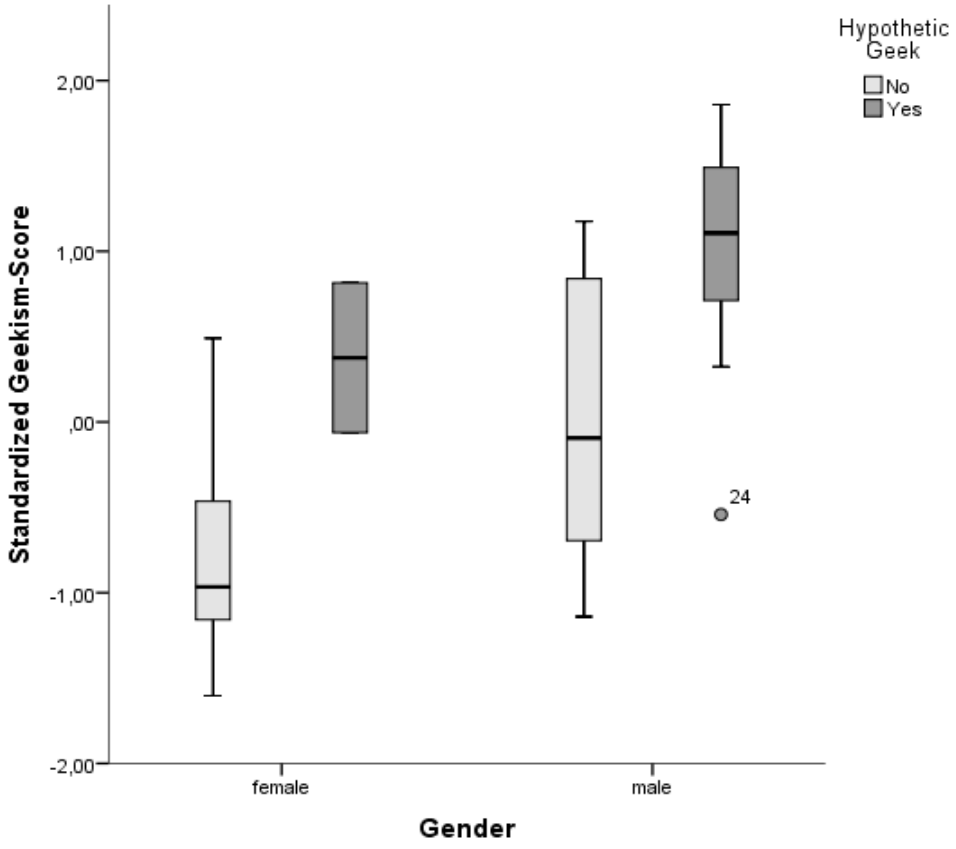
Results

Descriptive Statistics

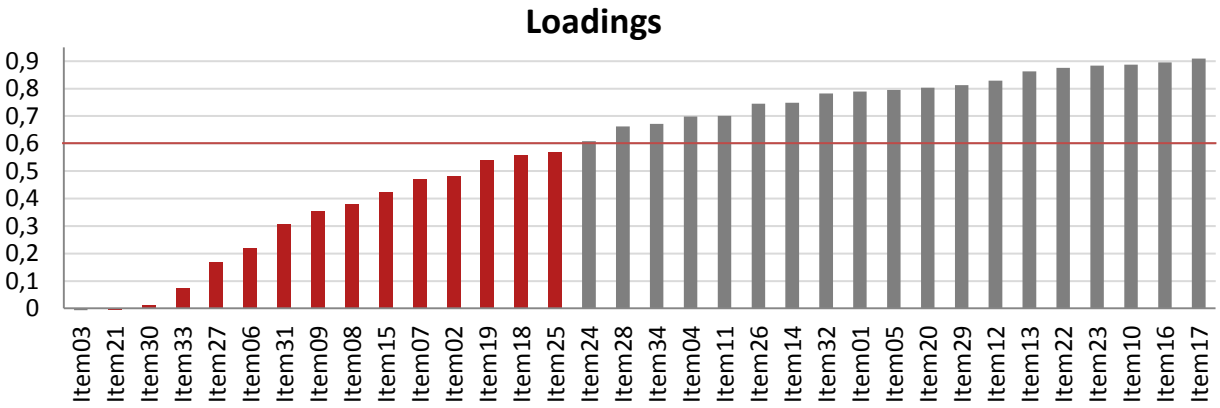
When comparing the mean scores of participants we expected to score high on the geekism-scale with the mean-scores of the other participants, significant results, within a significance level of $\alpha = .05$, can be found between these two groups.A seen in the boxplot below, participants we expected to score higher had much higher scores than the other participants. Furthermore, significant gender differences in the scores of the geekism scale were found. Females scored overall significantly lower on the geekism-scale with a standardized mean score of -0.703 whereas male participants scored with a standardized mean score of 0.56.0 Same results were found when gender differences when compared within their groups of expected geekism. The female participants which were expected to score high on geekism had a mean-score of 0.376, and the male’s mean-score of 1.019. Females in the group of

unexpected geekism had a mean-score of -0.793 whereas males in that group had a mean-score of -0.021.

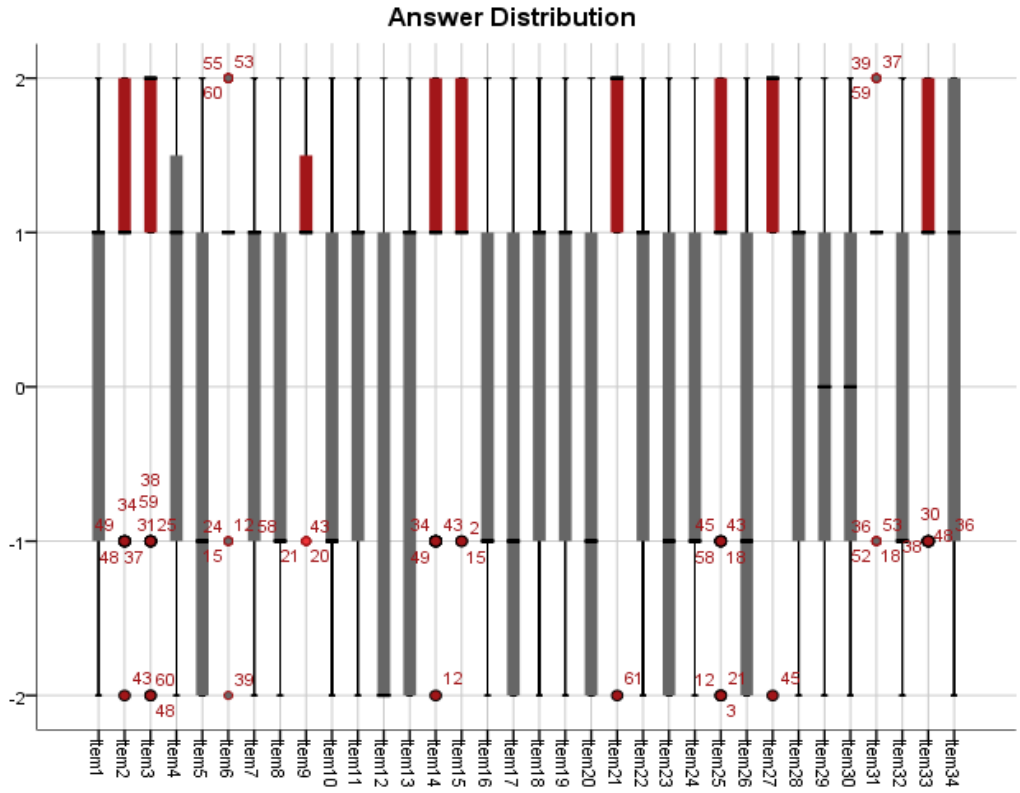
	Gender	Mean	N	SD
Geekism not expected	Female	-,7934	24	,58160
	Male	-,0210	15	,85040
	Total	-,4963	39	,78492
Geekism expected	Female	,3765	2	,61998
	Male	1,0199	19	,57500
	Total	,9586	21	,59517
Mean	Female	-,7034	26	,65395
	Male	,5607	34	,87312
	Total	,0129	60	1,00331



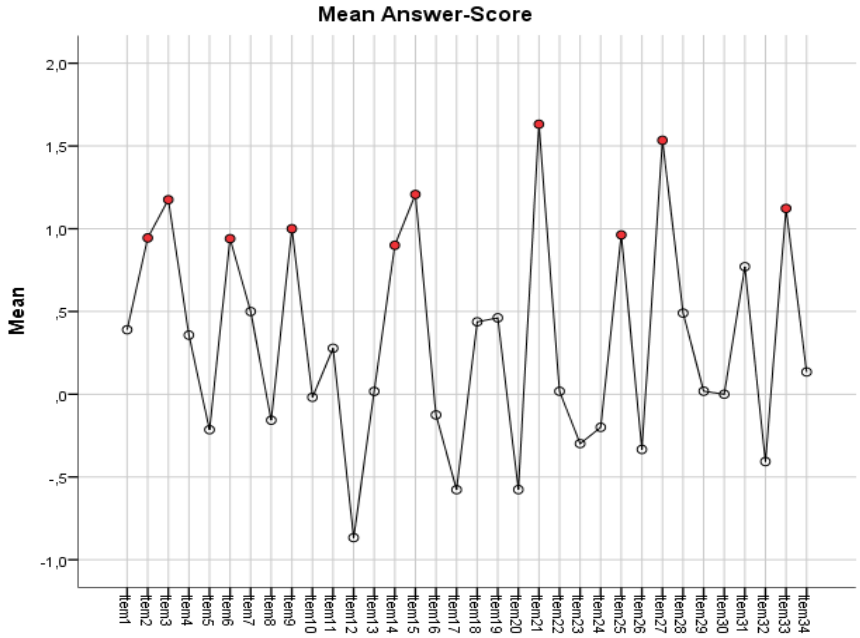
Item Analysis



At first, all the analyzed items were inspected regarding their loading to the general construct. Aiming for an average loading of .7, items 2, 3, 6, 7, 8, 9, 15, 18, 19, 21, 24, 25, 27, 30, 31 and 33showed low discriminate power with loadings lower than .6.. As seen in the boxplots below, analysis of the data-distribution revealed several polarized answer-range-distributions initems2, 3, 6, 9, 14, 15, 21, 25, 27, 31 and 33 which were (nearly) never answered with “I totally disagree”.



Further inspection of the data showed the influence of these effects on the mean-score of the items which is illustrated in the graph:



Trying to get an indication about which items are not appropriate and/or too difficult and/or not well formulated, the items missing values were analyzed. Following items were answered with *no answer* more than 10 times

Variable Summary[a]

	Missing		Valid N	Mean	Std. Deviation
	N	Percent			
Geek24	16	26,2%	45	-,20	1,342
Geek31	13	21,3%	48	,77	,928
Geek26	13	21,3%	48	-,33	1,478
Geek18	13	21,3%	48	,44	1,287
Geek30	11	18,0%	50	,00	1,229
Geek06	11	18,0%	50	,94	,890
Geek14	10	16,4%	51	,88	1,160

a. Minimum percentage of missing values for variable to be included: 15,0%

Reliability

Test-Retest analysis of the Geekism-Scale showed a very high reliability of .98,with 96% of the variance in the retest explained by the Geekism-Scale. Cronbachs alpha was calculated for the whole scale with a coefficient of .93 for the geekism scale as well as for the retest of the geekism scale.

	AVE	Reliability	R^2	Cronbachs α	Communality
Geekism-Scale	0,4162	0,9493	0	0,9386	0,4162
Geekism-ScaleRetest	0,3827	0,9426	0,9638	0,9343	0,3827

Validation-Hypothesis

We formulate 4 hypotheses to validate the Geekism-Scale. Because Julian Keils PES measures the same construct but through an implicit method, we hypothesize that the participants' scores of ourGeekism-scale correlates with the scores of Julian Keils PES scores of his geek subscale.

Our second hypothesis implies that the scores of our geekism-questionnaire correlate with the Need for Cognition Scaleas it is as similar construct. Because it's still differs from the construct of geekism we expect the correlation to be moderate.

Furthermore we expect a non-significant or negative correlation between the scores of our questionnaire and the Material-Possession-Love Scale, because we expect MPL to be a different construct than geekism. Therefore, we also hypothesized that Julian Keils subscore geekism would correlate also negatively or non-significant with the MPL.

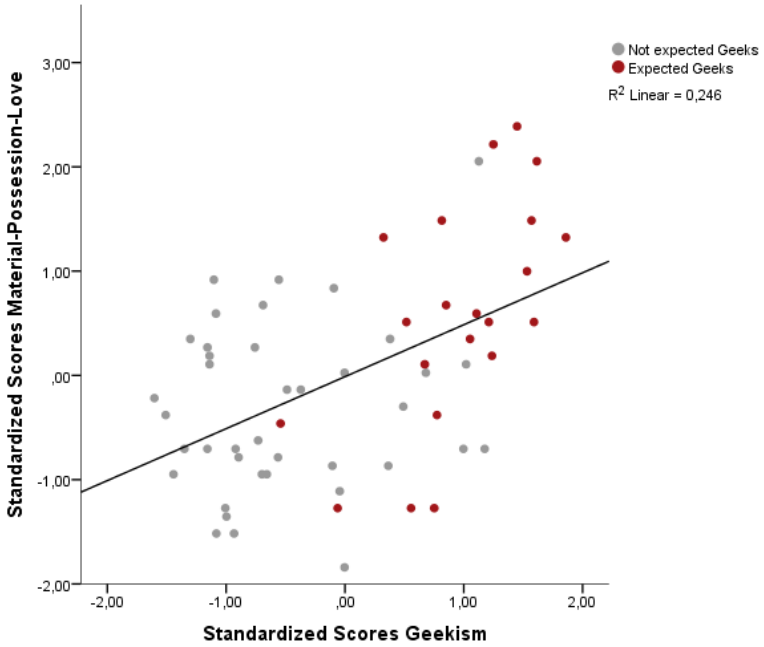
Validation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,536[a]	,287	,261	,85973

a. Predictors: (Constant), zGeekism

The construct validity was measured through correlational analysis with a significance level of $\alpha = 0.05$. Convergent Validity was measured through correlational analysis withthe geekism-subschale of Julian Keils Picture-Exercise-Story (2013). Analysis revealed a significant correlation of r = .536. R^2 indicates that 28% of the variance in Keil's geekism-subscale can be explained through the Geekism scale.

Next to Keils Geekism-Subscale, a statistical significant correlation between the Geekism scale and Material-Possession-Love was found of r = 0.489.with 23% of its variance explained by the geekism scale.



Analyzing the relationship between the subscale*geekism* of Julian Keils PES (2013) and the MPL, we found a non-significant(p>.05) correlation of 0.066

		PES-Geekscale	Geekism-scale	MPL
PES-geekscale	Pearson Correlation	----		
	Sig. (2-tailed)			
	N			
Geekism-scale	Pearson Correlation	,536**	----	
	Sig. (2-tailed)	,003		
	N	29		
zMPL	Pearson Correlation	,066	,489**	----
	Sig. (2-tailed)	,735	,000	
	N	29	61	

***. Correlation is significant at the 0.05 level (2-tailed).*

The Need for Cognition Scale correlated withr = .357 whereas 12 % of its variance could be explained with the geekism-scale.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,357[a]	,127	,112	,94217

a. Predictors: (Constant), zGeekism

Discussion

Conclusion

The gender differences of the geekism-scale scores are difficult to interpret as female participant scored overall lower than male participants. One could argue that the results regarding the gender differences are real and that until now, most of the people with geekism are male. Social norms and gender stereotypes could have arestrictive influence on the childhood experience of girls with technic, resulting in less contact with technology and/or less explanations regarding technology of the parents. However, research for the exact determinants which lead to this result would go beyond the boundaries of this study.

The results of the item-analysis showed that many of the geek-elements, described by Florian Passlick (2013), seem not only to be unique for Geeks but also for most of the participants.Because all items, created from Passlick's elements *Interest in versatile products, Value of sharing, Beeing in controle of the device, controle of own Data, Hedonism, Value of objectivity,* and *Helpfulness and giving support* had very low discriminant power and/or high mean values, it points to the conclusion that these elements aren't useful in our a questionaire. An explainenation could be that these items aren't typical geek elements, and therefore not discrimnant. All items which were based on following elements, as well as all items which weren't based on any element of Passlick's study (2013), showed high discriminant power with loadings >.6 to the general construct:

- Beeing an expert in subject area
- Beeing curious about technology
- Beeing in controle of own data
- Interest in versatile products
- Invest time/effort in subject
- Joy through challenge
- Motivated by optimization
- Re-using/alienating products

Noticable was that the two items, based on Passlicks elements *„Invest time / effort in subject“* had very different discrimimant power. Item 8 “In my free time, I am using the computer more often than other people” had low discriminant power with a loading of 0.40. Item 20 instead had a high discriminant. A possibe explanation could be the wording of the item 8 which could be a bit confusing for some of the participants. A similar situation is found for the items based on the element *Values of sharing*, where only item 11 “Ich habe schon einmal ein Projekt/eine Arbeit von mir frei ins Internet gestellt, bzw. würde dies tun” has discriminate power. It could be explained by stating that, the action of uploading projects online is typical for geeks, in contrast to the value of sharing the project itself, which could be the case for most of the people.

Items 14, 24 and 26 showed high values of missing answers although they had a high discriminant power. These results could implicate that the items could be discriminnating as they can just be answered by certain users, or it could mean that different users had problems unterstanding the questions or the formulation of the question.

The correlation between the scores of the Ge.e.Q. and the subschale from Julian Keils PES of .536 indicates a moderate to good correlation and supports our hypothesis that these two tests measure the same construct. Also, as expected, a moderate correlation between the Geekism-Scale and the Need For Cognition Scale can be found. The third hypothesis, that object-love and geekism are different construct can not be hold. Correlationl analysis showed a connection between these two constructs, and our hypothesis will be discarded. Unexpectedly, the PES geekism-subschalecorrelated low with the MPL indicating, that there must be a difference between the Geekism-scale and the PES-geekism subschale. Otherwise, both would correlate equaliy or , at least, similar with the MPL.

General Discussion

This study was set up to develop a pilot version of a questionnaire to assess a user-group which was nearly ignored in contemporary usability research. To assess a user-group coined as *geeks*, a qualitative interview study of Florian Passlick (2013) in which he shed light on the construct, served as a basis for item-construction. Some of Passlicks geek-typical elements, on which our items could be identified as not compatible with the geekism scale, as they included nearly all of the weak items. These items were considered as not useful, as they showed low discriminant values, answer-polarizations or many missing value. However, many different elements from Passlick’s study, and their relating items showed high discriminant power, and were evaluated as strong. The reliability of the test was high with ahigh Cronbachs alpha, a high test-retest correlation, andindicating a good and stable

psychometric basis. Also, the moderate to good correlation with Julian Keils PSE geekism-subscale confirms the convergent validity of our pilot-scale. Furthermore our Geekism-Scale correlated with the NFC-Scale moderately. The need for cognition seems to overlap with many characteristics of the geek culture. As we still acknowledged the differences between the two constructs, a moderate correlation was expected.

We also found a not-expected moderate to good correlation of the Geekism-Scale with the Material-Possession-Love scale. It is thus indicated that some geeks have an intimate relation as well as an emotional attachment with their technology which exceedsa joyful experience while interacting with technology. Interestingly, the geekism-subscale of Keils implicit test correlated very low with the Material-Possession-Love Scale. This result indicates that, also both may measure geekism in some kind, both seem to measure different aspects of the construct geekism. A possible explanation could be the divergence of the two methods: Keils study is an implicit and projective test, and is based on the assumption that the participant's inner drives and needs influence their answers in the test. The explicit Geekism-questionnaire on the other depends on conscious self-report by answering conform to social norms. It could be hypothesized that the projective measures are more suitable for assessing the unconscious needs of the user as their values and motivation and that the questionnaire is more suitable for more conscious experiences as actual behavior.. These differences could account for the fact that especially the items which were based on elements related to *values and attitude*s were evaluated as not adequate, looking at the discriminant power. However, why exactly the MPL shows correlation with the Geekism-Scale but not with Keils PES remains unclear and could be subject for further studies.

However, there were some limitations which might have influenced the results negatively. At first the total number of people we expected to have geekism could have been bigger to achieve more discriminating results. Also, as we discussed before there are some negative points of using self-report measures in personality assessment. At first, self-reports rely on the subjective rating of the participant themselves which means that some respondents could fail to think carefully about their answer, which could mean that they refer to special situations which fall into their minds when answering the question, rather than searching their memory for the right answer (Lucas & Baird, 2006). Another pitfall of self-report measures is the fact that participants want to present themselves in a good light many times, or want to answer conform certain social norms. Especially when it comes to the use of computer, one could try not to look like a "computer-freak" in order to avoid this negative defining label.Another important aspect could be that our questionnaire was filled out among

many other questionnaires which could have led to the fact that questions were answered superficially as the participants get bored caused by the amount of questions they had to answer (Harvey, 1999).

Future studies could try to develop the Geekism-Scale further. As we identified the strongest items and their respective elements, more items for these elements could be formulated. Furthermore, the items which were evaluated as weak, could be analyzed be their formulation or to what extent they could be modified be more discriminate. Also, the items which were answered many times with *no answers* but which were evaluated as discriminant can be analyzed for their formulation.

When it comes to more contend related implication for future studies, the gender differences between *geeks* could be analyzed further as well as geekism and its relation to Material-Possession.

Overall, we evaluate the pilot-study as successful as it managed to show the contemporary weaknesses of the scale, as well as the strong characteristics, which is a good basis for further development of the scale.

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Appendix

Die folgenden Behauptungen beinhalten oft Wörter wie Computer, oder technische Geräte. Denken Sie hierbei immer auch an Laptops, Smartphones, Tablets und andere technische Geräte. Studentennummer: Geburtsdatum: Männlich/Weiblich?		Ich stimme vollkommen zu	Ich stimme zu	Keine Antwort	Ich stimme nicht zu	Ich stimmt überhaupt nicht zu
1	Ich möchte verstehen, wie Computer(teile)/Software funktionieren.					
2	Wenn jemand Hilfe mit dem Computer braucht, versuche ich so gut wie möglich zu helfen.					
3	Privatsphäre(-einstellungen) am Computern oder im Internet ist sehr wichtig für mich.					
4	Komplizierte Vorgänge mit technischen Geräten schrecken mich ab.					
5	Ich habe schon einmal technische Geräte zweckentfremdet oder modifiziert.					
6	Objektivität ist wichtig für mich.					
7	Ich habe nicht das Gefühl, viel Kontrolle über meine technischen Geräte zu haben.					
8	In meiner Freizeit verbringe ich nicht mehr Zeit am Computer/an technischen Geräten, als andere Menschen.					
9	Wenn ich mir ein neues Computergerät kaufe, ist mir die Leistung wichtiger als die äußere Erscheinung.					
10	Es motiviert mich, technische Geräte zu optimieren/auf meine Wünsche anzupassen.					
11	Ich habe schon einmal ein Projekt/eine Arbeit von mir frei ins Internet gestellt, bzw. würde dies tun.					
12	Ich denke es gibt Menschen, die mich einen Computerfreak nennen würden.					
13	Das Innenleben technischer Geräte und/oder das Programmieren von Software interessiert mich nicht.					
14	Ich vermeide die erweiterten Optionen meiner technischen Geräte.					
15	Ich teile gerne meine Ideen und Projekte mit anderen.					
16	Herausfordernde Aufgaben an technischen Geräten reizen mich.					
17	Ich verfüge über ein großes Wissen, was Computergeräte betrifft (Hardware/Software).					
18	Ich versuche so wissenschaftlich wie möglich an Dinge heranzugehen.					
19	Ich bin interessiert an technischen Produkten, welche vielseitig einsetzbar sind.					

		Ich stimme vollkommen zu	Ich stimme zu	Keine Antwort	Ich stimme nicht zu	Ich stimmt überhaupt nicht
20	Ich investiere viel Zeit und Mühe damit, Dinge mit Computergeräten/Software auszuprobieren.					
21	Es ist wichtig, dass sich jeder Gedanken macht, was er ins Internet hochläd und was nicht.					
22	Ich eigne mir gerne Wissen bezüglich technischen Geräten (Hardware/Software) an.					
23	Ich habe schon des Öfteren technische Geräte geöffnet, um zu sehen, wie diese von innen aussehen.					
24	Mir ist es wichtig, dass Menschen freien Zugang zu meinen Projekten oder Arbeiten haben.					
25	Mir gefällt es, technische Geräte genau so steuern zu können, wie ich es möchte.					
26	Technische Geräte verwende ich teilweise anders als vorhergesehen.					
27	Ich finde es toll, dass sich Computerbenutzer gegenseitig bei Problemen helfen (Foren, Websites).					
28	Viele Einstellungsmöglichkeiten an technischen Geräten finde ich abschreckend.					
29	Wenn es Probleme mit technischen Geräten gibt, muss mir meistens jemand anderes helfen.					
30	Ein technisches Produkt muss für mich schön aussehen.					
31	Ich mag technische Geräte, die sehr viele verschiedene Funktionen haben.					
32	Ich investiere viel Zeit und Mühe damit, Dinge mit Computergeräten/Software auszuprobieren.					
33	Ich achte sehr bewusst auf den Umgang meiner eigenen Daten bezüglich der Privatsphäre.					
34	Mein Studium/ meine Arbeit hat viel mit der Technik von Computern oder mir Software zu tun					

Syntax

```
GET
  FILE='D:\Documents\Uni\Jahr 3\Blok 4\Bachelor\Datenanalyse\Alle Scales.sav'.
DATASET NAME DatenSet3 WINDOW=FRONT.
* Diagrammerstellung.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=Gender zGeekism MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE.
BEGIN GPL
  SOURCE: s=userSource(id("graphdataset"))
  DATA: Gender=col(source(s), name("Gender"), unit.category())
  DATA: zGeekism=col(source(s), name("zGeekism"))
  DATA: id=col(source(s), name("$CASENUM"), unit.category())
  GUIDE: axis(dim(1), label("Gender"))
  GUIDE: axis(dim(2), label("zGeekism"))
  SCALE: cat(dim(1), include("1", "2"))
  SCALE: linear(dim(2), include(0))
  ELEMENT: schema(position(bin.quantile.letter(Gender*zGeekism)), label(id))


RELIABILITY
  /VARIABLES=Geekism_Item1 Geekism_Item2 Geekism_Item3 Geekism_Item4 Geekism_Item5 Geekism_Item6 Geekism_Item7
Geekism_Item8 Geekism_Item9 Geekism_Item10 Geekism_Item11 Geekism_Item12 Geekism_Item13 Geekism_Item14 Geekism_Item15
Geekism_Item16
Geekism_Item17 Geekism_Item18 Geekism_Item19 Geekism_Item20 Geekism_Item21 Geekism_Item22 Geekism_Item23
Geekism_Item24 Geekism_Item25 Geekism_Item26 Geekism_Item27 Geekism_Item28 Geekism_Item29 Geekism_Item30
Geekism_Item31 Geekism_Item32 Geekism_Item33
Geekism_Item34
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL MEANS.


REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT zGimpl
  /METHOD=ENTER zGeekism.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT zNCS
  /METHOD=ENTER zGeekism.

REGRESSION
```

```
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT zMPL
  /METHOD=ENTER zGimpl.

* Diagrammerstellung.
GGRAPH
  /GRAPHDATASET NAME="graphdataset" VARIABLES=zGeekismzMPLgeekField MISSING=LISTWISE REPORTMISSING=NO
  /GRAPHSPEC SOURCE=INLINE.
BEGIN GPL
  SOURCE: s=userSource(id("graphdataset"))
  DATA: zGeekism=col(source(s), name("zGeekism"))
  DATA: zMPL=col(source(s), name("zMPL"))
  DATA: geekField=col(source(s), name("geekField"), unit.category())
  GUIDE: axis(dim(1), label("zGeekism"))
  GUIDE: axis(dim(2), label("zMPL"))
  GUIDE: legend(aesthetic(aesthetic.color.exterior), label("geekField"))
  ELEMENT: point(position(zGeekism*zMPL), color.exterior(geekField))
END GPL.

*Analyze Patterns of Missing Values.
MULTIPLE IMPUTATION  Geek01 Geek02 Geek03 Geek04 Geek05 Geek06 Geek07 Geek08 Geek09 Geek10 Geek11 Geek12 Geek13
Geek14 Geek15 Geek16 Geek17 Geek18 Geek19 Geek20 Geek21 Geek22 Geek23 Geek24 Geek25 Geek26 Geek27 Geek28 Geek29
Geek30 Geek31 Geek32 Geek33
Geek34
  /IMPUTE METHOD=NONE
  /MISSINGSUMMARIES  OVERALL VARIABLES (MAXVARS=50 MINPCTMISSING=15) PATTERNS.
```

Smart Pls Data: Geekism-Scale; PES; MPL

Quality Criteria

Overview

	AVE	CompositeReliability	R Square	Cronbachs Alpha
Geekism	1,000000	1,000000		1,000000
MPL	1,000000	1,000000	0,241848	1,000000
PES	1,000000	1,000000		1,000000

	Communality	Redundancy
Geekism	1,000000	
MPL	1,000000	0,238712
PES	1,000000	

Redundancy

	redundancy
Geekism	
MPL	0,238712
PES	

Cronbachs Alpha

	Cronbachs Alpha
Geekism	1,000000
MPL	1,000000
PES	1,000000

Latent VariableCorrelations

	Geekism	MPL	PES
Geekism	1,000000		
MPL	0,488625	1,000000	
PES	-0,116688	-0,112255	1,000000

R Square

	R Square
Geekism	
MPL	0,241848
PES	

Cross Loadings

	Geekism	MPL	PES
""zGeekism""	1,000000	0,488625	-0,116688

""zGimpl""	-0,116688	-0,112255	1,000000
""zMPL""	0,488625	1,000000	-0,112255

AVE

	AVE
Geekism	1,000000
MPL	1,000000
PES	1,000000

Communality

	communality
Geekism	1,000000
MPL	1,000000
PES	1,000000

Total Effects

	Geekism	MPL	PES
Geekism		0,482091	
MPL			
PES		-0,056001	

CompositeReliability

	CompositeReliability
Geekism	1,000000
MPL	1,000000
PES	1,000000

CalculationResults

Stop Criterion Changes

	""zGeekism""	""zGimpl""	""zMPL""
Iteration 0	1,000000	1,000000	1,000000
Iteration 1	1,000000	1,000000	1,000000

Outer Loadings

	Geekism	MPL	PES
""zGeekism""	1,000000		
""zGimpl""			1,000000
""zMPL""		1,000000	

Outer Model (Weights or Loadings)

	Geekism	MPL	PES
""zGeekism""	1,000000		
""zGimpl""			1,000000
""zMPL""		1,000000	

PathCoefficients

	Geekism	MPL	PES
Geekism		0,482091	
MPL			
PES		-0,056001	

Outer Weights

	Geekism	MPL	PES
""zGeekism""	1,000000		
""zGimpl""			1,000000
""zMPL""		1,000000	

Index Values

Results

Measurement Model (restandardised)

	Geekism	MPL	PES
""zGeekism""	1,008299		
""zGimpl""			0,020225
""zMPL""		1,008299	

PathCoefficients

	Geekism	MPL	PES
Geekism		0,482091	
MPL			
PES		-0,001123	

Measurement Model

	Geekism	MPL	PES
""zGeekism""	1,000000		
""zGimpl""			1,000000
""zMPL""		1,000000	

Index Valuesfor Latent Variables

	LV Index Values
Geekism	-0,000000
MPL	0,000000
PES	-51,934426

Smart PLS – Tests/Re-Test

Quality Criteria

Overview

	AVE	CompositeReliability	R Square	Cronbachs Alpha
Geekism	0,416192	0,949287		0,938575
Retest	0,382711	0,942647	0,963833	0,934256

	Communality	Redundancy
Geekism	0,416192	
Retest	0,382711	0,367065

Redundancy

	redundancy
Geekism	
Retest	0,367065

Cronbachs Alpha

	Cronbachs Alpha
Geekism	0,938575
Retest	0,934256

Latent VariableCorrelations

	Geekism	Retest
Geekism	1,000000	
Retest	0,981750	1,000000

R Square

	R Square
Geekism	
Retest	0,963833

Cross Loadings

	Geekism	Retest
Geek01	0,861875	0,851856
Geek02	0,569331	0,545556
Geek03	-0,185203	-0,171442
Geek04	0,645872	0,640048
Geek05	0,859541	0,839889
Geek06	0,101368	0,099370
Geek07	0,480022	0,432125
Geek08	0,405793	0,453192
Geek09	0,492377	0,465671
Geek10	0,924909	0,896988
Geek11	0,661385	0,653405
Geek12	0,816779	0,823628
Geek13	0,908014	0,907032
Geek14	0,763545	0,740684
Geek15	0,396255	0,395601
Geek16	0,894038	0,881800
Geek17	0,879694	0,866430
Geek18	0,628494	0,613078

Geek19	0,402435	0,399957
Geek20	0,770702	0,766556
Geek21	-0,099381	-0,032559
Geek22	0,877012	0,851890
Geek23	0,903414	0,890577
Geek24	0,552029	0,500785
Geek25	0,630651	0,615106
Geek26	0,699315	0,667566
Geek27	0,278445	0,241512
Geek28	0,628044	0,611621
Geek29	0,828762	0,829823
Geek30	-0,060255	-0,019413
Geek31	0,293393	0,271534
Geek32	0,761064	0,761797
Geek33	0,095092	0,145890
Geek34	0,611062	0,593614
GeekR01	0,815528	0,819553
GeekR02	0,525520	0,502943
GeekR03	-0,143705	-0,083535
GeekR04	0,768936	0,791708
GeekR05	0,816225	0,833193
GeekR06	0,268436	0,316941
GeekR07	0,666867	0,660500
GeekR08	0,447803	0,424548

GeekR09	0,363484	0,398767
GeekR10	0,600779	0,636371
GeekR11	0,602156	0,626631
GeekR12	0,807764	0,805908
GeekR13	0,756920	0,797926
GeekR14	0,290967	0,256102
GeekR15	0,366971	0,407587
GeekR16	0,850119	0,871394
GeekR17	0,911123	0,911460
GeekR18	0,502390	0,551005
GeekR19	0,432539	0,476558
GeekR20	0,805602	0,816176
GeekR21	0,026528	0,082007
GeekR22	0,860758	0,848330
GeekR23	0,872601	0,899877
GeekR24	0,470620	0,465230
GeekR25	0,394176	0,414659
GeekR26	0,731501	0,757991
GeekR27	0,100287	0,148607
GeekR28	0,629294	0,652111
GeekR29	0,747725	0,743022
GeekR30	-0,094086	-0,111945
GeekR31	0,251872	0,295998
GeekR32	0,791822	0,800111

GeekR33	-0,054309	0,019021
GeekR34	0,741694	0,736159

AVE

	AVE
Geekism	0,416192
Retest	0,382711

Communality

	communality
Geekism	0,416192
Retest	0,382711

Total Effects

	Geekism	Retest
Geekism		0,981750
Retest		

CompositeReliability

	CompositeReliability
Geekism	0,949287
Retest	0,942647